DRAFT MEMORANDUM

Date: October 1, 2008

Re: Washington State T-1 TIWG/Climate Change Subgroup: Transit Cost Effectiveness – Calculation Approach

We propose to calculate the cost of proposed transit expansions in Washington State according to the following formula:

Cost of transit investment	=	(1) operating costs, capital maintenance costs, capital expansion costs	-	(2) societal cost savings from reduced vehicle travel

Operating costs, capital maintenance costs, and capital expansion costs associated with expansion of transit service to the year 2020 have already been estimated by Washington State transit agencies. These estimates account for existing operating revenues.

Societal cost savings from reduced vehicle travel can be estimated following a methodology developed in a study conducted for the Minneapolis-St. Paul region in 2000.[1] The study calculates the total societal costs of all existing on-road transportation activity in the region. Costs are subdivided into costs paid by the government (governmental), costs paid by vehicle drivers (internal), and costs paid by other people (external). We adapt this framework to calculate marginal cost savings that can be expected from shifting trips from private vehicles to transit.

The table below lists the types of costs examined within each of these categories, along with our proposed approach for calculating costs in Washington State. Many of these costs will not vary substantially in response to an expansion in transit service within our short time frame (to 2020). For the sake of simplicity, we propose to ignore costs that are not clearly affected by marginal changes in VMT such as those expected in response to the transit expansion.

Suggested data sources, referenced in the Twin Cities study, are listed where appropriate. The Twin Cities study relies heavily on a previous study by Delucchi.[2] The Twin Cities study is now 8 years old. There may be more up-to-date and/or more regionally specific data now available for Washington State. One study that merits further investigation was released by Puget Sound Regional Council in 1995.[3]

[1] Anderson, David and Gerard McCullough. The Full Cost of Transportation in the Twin Cities Region. University of Minnesota, August 2000.
[2] Delucchi, M., et al., "The Annualized Social Cost of Motor Vehicle Use in the U.S. Based on 1990-1991 Data," in 20 reports, University of California, Institute for Transportation Studies, Davis, CA, 1996.
[3] Puget Sound Regional Council. The Costs of Transportation: Expenditures on Surface Transportation in the Central Puget Sound Region for 1995. October 1996.

Transportation Cost Elements: Proposed Treatments

Cost	Include?	Reasoning / Approach / Data Sources
Governmental Costs		
Streets and Highways	no	negligible impact from transit expansion
Transit	no	included in part (1) of the equation
Law Enforcement and Safety	no	negligible impact from transit expansion
Environmental Cleanup	no	negligible impact from transit expansion
Energy Security [i]	no	negligible impact from transit expansion
Parking [ii]	?	calculate state share of national cost (from Delucchi) based on state share of housing value (Twin Cities approach)
Costs to Other Agencies	no	negligible impact from transit expansion
Internal to driver/owner		
Fixed and variable vehicle costs	yes	multiply state VMT by cost per vehicle-mile (from Runzheimer Intl 1998). account for likely increase in fuel cost. (Twin Cities approach)
Transit Fares	no	included in part (1) of the equation
Travel Time	no	assume no change in travel time from switching to transit
Other Personal Time [iii]	no	negligible impact from transit expansion
Crashes	--	internal crash costs covered under external costs below
Parking and Driveways	?	for capital costs: state share of national cost (from Delucchi) based on share of national housing value. for parking fees: available local data on parking supply and rates
External to driver/owner		
Congestion	?	difficult to quantify impact of transit expansion
Crashes	yes	NHTSA crash rates by state, including rates per 100 million VMT. FHWA estimates of cost per crash. (Twin Cities approach)
Air pollution [iv]	?	may require modeling to estimate impact on pollutant concentrations. monetized values available from Delucchi or PSRC studies
Global warming	no	GHG reductions are captured as a benefit of transit expansion
Noise	no	negligible impact from transit expansion
Fires and Robberies	no	negligible impact from transit expansion
Petroleum Consumption [v]	yes	calculate state share based on share of national fuel consumption (from Delucchi) (Twin Cities approach)

[i] Energy security costs include ethanol subsidies, R&D to improve energy security, costs of maintaining the Strategic Petroleum Reserve, and military expenditures

[ii] Parking costs include free and subsidized parking spots provided by government agencies

[iii] Other personal time includes time spent maintaining, buying and selling, and learning to drive vehicles

[iv] Air pollution costs include impacts to human health, visibility, crops, materials, and forests

[v] Petroleum consumption costs include losses to GDP due to oil price fluctuations